AS–1389

B.Sc. (Part–I) Semester–II Examination

ELECTRONICS

(Digital Electronics)

Time : Three Hours]

[Maximum Marks : 80

N.B. :– (1) **All** questions carry equal marks.

(2) Draw neat sketches wherever necessary.

1. (A) Fill in the blanks :

(i) CMOS stands for _____.

(ii) A half adder has _____ outputs.

(iii) The base of a number system is also called as _____.

(iv) MOD-5 counter requires _____ no. of flip-flops.   2

(B) Choose correct alternative & rewrite the following :

(i) PROM is _____ memory.

(a) Programmable (b) Read only

(c) Programmable read only (d) None

(ii) To avoid race around condition _____ flip flop is used.

(a) RS (b) JK

(c) JKMS (d) none

(iii) The base of octal number system is :

(a) 2 (b) 4

(c) 8 (d) 16

(iv) 1's complement of 0101 is :

(a) 1111 (b) 1100

(c) 1010 (d) None   2

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(C) Answer in **one** sentence :

    (i)   What is encoder ?

    (ii)   What is Astable Multivibrator ?

    (iii) What is Demultiplexer ?

    (iv) What is ROM ?   4

EITHER

2. (a) Convert the following :

    (i) $(1110.11)_2 = (x)_{10}$

    (ii) $(031.1)_8 = (x)_{10}$

    (iii) $(03FF)_{16} = (x)_{10}$ 6

  (b) Give logic symbols, boolean equations and truth table for NOT, OR and NOR gates. 6

OR

  (p) Explain construction and working of 4-bit adder.   6

  (q) Explain EX-OR and EX-NOR gates with truth table and give the logic equations of both the gates. 6

EITHER

3. (a) Explain any three characteristics of Logic Families.   6

  (b) Prove that :

    (i) $\overline{(A + B)} = \overline{A}.\overline{B}$

    (ii) $\overline{(A . B)} = \overline{A} + \overline{B}$ 6

OR

  (p) Explain TTL NAND gate with suitable diagram.   6

  (q) Explain the various types of grouping used in K.maps to reduce the logic gates. 6

EITHER

4. (a) Draw the logic diagram of RS-flip flop and explain its working. Draw truth table. 6

  (b) Draw and explain construction and working of transistorized monostable multivibrator. 6

OR

  (p) Draw and explain JKMS flip-flop.   6

  (q) Explain JKFF. What is race around condition ? 6

EITHER

5. (a) Explain the working of SISO shift register. 6

   (b) Explain the working of ring counter with truth table. 6

   OR

   (p) Explain working of asynchronous up counter with suitable diagram and waveform. 6

   (q) Explain SIPO shift register with truth table. 6

EITHER

6. (a) Explain 1 : 4 demultiplexer in detail. 6

   (b) Draw and explain decimal to BCD encoder with suitable diagram. 6

   OR

   (p) Explain operation of BCD to decimal decoder. 6

   (q) Explain operation of 4 : 1 multiplexer. 6

EITHER

7. (a) State types of semiconductor memories. Explain any two types. 6

   (b) Explain the concept of memory Hierarchy. 6

   OR

   (p) Explain primary and secondary memories. 6

   (q) Explain volatile and non-volatile memories. 6